ASTRONOMY AND ASTROPHYSICS

A European Journal

Volume 115 1982

Published by Springer International on behalf of the Board of Directors

Astronomy and Astrophysics A European Journal

Board of Directors

Chairman: G. Contopoulos (Greece)

R. A. J. Coutrez (Belgique)

Vice Chairman: B. Hauck (Switzerland)

H. Haupt (Austria)

A. G. Hearn (The Netherlands)

K. Hunger (Germany, Federal Republic)

G. Larsson-Leander (Sweden)

W. Priester (Germany, Federal Republic)

A. Reiz (Denmark)

E. Schatzman (France)

G. Setti (Italy)

J. L. Steinberg (France)

L. Woltjer (ESO)

Editors-in-Chief

J. Lequeux
Observatoire de Meudon
92190 Meudon (France)
Tel. 534-75-30 ext 368

M. Grewing
Astronomy and Astrophysics
Editorial Office
Keplerstrasse 17
7400 Tübingen
(Fed. Rep. of Germany)
Tel. (07071) 294982

Letter-Editor

S. R. Pottasch
Kapteyn Laboratorium
P. O. Box 800
9700 AV Groningen
(The Netherlands)
Tel. 050-116643

Editing Secretaries

Miss B. Perche
Mrs. M. Rougeot

Mrs. V. Berchtold

Mrs. E. Goss

The exclusive copyright © for all languages and countries, including the right for photomechanical and any other reproduction, also in microform, is vested in European Southern Observatory (ESO).
The use of registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Springer-Verlag KG · Berlin · Heidelberg · New York
Printed in Germany
Printers: Brühlsche Universitätsdruckerei, Gießen

Volume 115 1982

Contents

Stellar Structure and Evolution

(LE) Evolution of Low Mass Zero Metal Giants up to the Helium Flash
D'Antona, F. L1

Contribution to the Study of Composite Spectra. III. Spectrum Binaries: Intermediate Class Between Visual and Spectroscopic Binaries? (Text in French)
Carquillat, J.M., Nadal, R., Ginestet, N., Pedoussaut, A. 23

The Very Small Amplitude Cepheids HD 9250 and HD 14662
Burki, G., Benz, W. 30

The Theoretically Expected X-ray Luminosity and the Binary Nature of Wolf-Rayet Runaway Stars
Vanbeveren, D., Van Rensbergen, W., de Loore, C. 69

Properties and Nature of Be and Shell Stars. 7 B.88 Her – An Important Clue to Understanding the Be Phenomenon?
Doazan, V., Harmanec, P., Koubsky, P., Krpata, J., Zdarsky, F. 138

Photometric Observations of CN Orionis
Schoembs, R. 190

A Photometric Study of the Eclipsing Binary V 889 Aql: An Example of Relativistic Apsidal Motion
Giménez, A., Scaltriti, F. 321

Frequency Analyses of Light and Radial Velocity Observations of α Lup
Lampens, P., Goossens, M. 413

Stellar Atmospheres

A Study of Ultraviolet Spectra of ζ Aur/VV Cep Systems. I. Resonance Line Formation
Hempe, K. 133

Carbon, Nitrogen and Oxygen Abundances in G8–K3 Giant Stars
Kj rgaard, P., Gustafsson, B., Walker, G.A.H., Hultqvist, L. 145

Abundances in Metal-poor Stars. I. The Globular Clusters NGC 2808, NGC 3201, NGC 6397, and M22
Gratton, R.G. 171

(RN) A Note on Garcia-Alegre et al.'s Article, "A Model for Constructing Artificial Integrated Spectral Lines and Their Fourier Transform Properties Relevant to the Search for Differential Rotation of Stars"
Bruning, D.H. 203

(RN) Infrared Observations of OH/IR Stars
Willems, F., de Jong, T. 213

The Angular Diameter of Betelgeuse
Balega, Y., Blazit, A., Bonneau, D., Koechlin, L., Foy, R., Labeyrie, A. 253

The Angular Beaming Model of Microstructure and the Subpulse Drifting Phenomenon
Gil, J. 270

A Photoelectric Investigation of Ap-stars in Open Clusters. III. NGC 2362, NGC 2546, and NGC 3228
Maitzen, H.M. 275

Chromospheric Mg II Emission in A5 to K5 Main Sequence Stars from High Resolution IUE Spectra
Blanco, C., Bruca, L., Catalano, S., Marilli, E. 280

Abundances in Metal-poor Stars. II. The Anomalous Globular Cluster ω Centauri
Gratton, R.G. 336

Abundance of Lithium in Unevolved Halo Stars and Old Disk Stars: Interpretation and Consequences
Spite, F., Spite, M. 357

Galactic Structure, Stellar Dynamics

On the Difference Between the Initial Mass Function of Single Stars and of Primaries of Binaries
Vanbeveren, D. 65

Photographic Surface Photometry of the Milky Way. IV. The Northern Milky Way in the Ultraviolet Spectral Region (Text in German)
Winkler, C., Schmidt-Kaler, T., Schlosser, W. 115

Interstellar Matter

Kinematics of Ring-shaped Nebulae in the LMC. II. The Radial Velocity Field of N 185
Rosado, M., Georgelin, Y.M., Georgelin, Y.P., Laval, A., Monnet, G. 61

Absolute Photometry of the Crab Nebula
Greve, A., van Genderen, A.M. 79

Aperture Synthesis Observations of Recombination Lines from Compact H II Regions. V. NGC 7538
Goss, W.M., van Gorkom, J.H., Forster, J.R. 164

Detection of the (8,8) and (9,9) Absorption Lines of Ammonia: The Hot Molecular Cloud Toward Sgr B2
Wilson, T.L., Ruf, K., Walmsley, C.M., Martin, R.N., Pauls, T.A., Batrla, W. 185

(RN) The Effects of the Coronal Gas on the Champagne Phase
Tenorio-Tagle, G., Bedijn, P.J. 207

On Interstellar Linear Polarization and Grain Growth
Aannestad, P.A. 219

An Effelsberg – Green Bank Galactic H I Absorption Line Survey. II. Results and Interpretation
Mebold, U., Winnberg, A., Kalberla, P.M.W., Goss, W.M. 223

Fine Structure in High Velocity Clouds Near the South Celestial Pole
Morras, R. 249

Far Infrared Observations of a Star Forming Region in Serpens
Nordh, H.L., van Duinen, R.J., Sargent, A.I., Fridlund, C.V.M., Aalders, J.W.G., Beintema, D. 308

The Galactic Abundance Gradient from Supernova Remnant Observations
Binette, L., Dopita, M.A., D'Odorico, S., Benvenuti, P. 315

The Law of Interstellar Absorption in the Wave-number Interval 0.95 μ^{-1} to 3.03 μ^{-1}
Ardeberg, A., Virdefors, B. 347

The Local Interstellar Medium as Traced by Gamma Rays
Strong, A.W., Bignami, G.F., Bloemen, J.B.G.M., Buccheri, R., Caraveo, P.A., Hermsen, W., Kanbach, G., Lebrun, F., Mayer-Hasselwander, H.A., Paul, J.A., Wills, R.D. 404

(RN) Observations of Bipolar Planetary Nebula 19W32
Kohoutek, L. 420

(RN) Radio Observations of Small Diameter Sources in the Field of the Supernova Remnant S147
Fürst, E., Reich, W., Beck, R., Hirth, W., Angerhofer, P.E. 428

Galaxies and Cosmology

The Precision on the Measure of q_0 Using the Gravitational Lensing Effect
Lacroix, G., Schneider, J. 54

Infrared Emission and Star Formation in NGC 5253
Moorwood, A.F.M., Glass, I.S. 84

The Two-colour Diagram of Luminous Stars in the Magellanic Clouds (Text in German)
Isserstedt, J. 97

(RN) The Detection of Extranuclear Emission Lines in the Seyfert Galaxies Mk10 and Mk79
Schulz, H. 209

Asymmetric Emission-line Regions with Out-flowing Mass in QSOs and the $Z_{ab} \gtrsim Z_{em}$ Systems
Goldman, I., Bahcall, J.N. 242

New High Resolution Radio Observations of NGC 4258. III. VLA and WSRT Observations of the Anomalous Arms
van Albada, G.D., van der Hulst, J.M. 263

NGC 1961: Stripping of a Supermassive Spiral Galaxy
Shostak, G.S., Hummel, E., Shaver, P.A., van der Hulst, J.M., van der Kruit, P.C. 293

The Giant Spiral Galaxy M 101. VIII. Star Formation in H I-H II Associations
Viallefond, F., Goss, W.M., Allen, R.J. 373

Photographic Photometry of Galaxies Using the INMP. I. The Lenticulars NGC 404 and NGC 524
Barbon, R., Capaccioli, M., Rampazzo, R. 388

Null Influence of Possible Local Extragalactic Perturbations on Tests of Redshift-Distance Laws
Nicoll, J.F., Segal, I.E. 398

(RN) The Quasar B2 1320+29
Feretti, L., Giovannini, G., Parma, P. 423

The Sun

Non-LTE Resonance Line Polarization with Partial Redistribution Effects
Rees, D.E., Saliba, G.J. 1

Coronal Loop Transients in Streamer Configurations
Steinolfson, R.S. 39

Coronal Response to a Solar Event in a Corona Evacuated by a Prior Transient
Steinolfson, R.S. 50

Empirical NLTE Analyses of Solar Spectral Lines. III. Iron Lines Versus LTE Models of the Photosphere
Rutten, R.J., Kostik, R.I. 104

Measurements of Solar Transition Zone Velocities and Line Broadening Using the Ultraviolet Spectrometer and Polarimeter on the Solar Maximum Mission
Simon, G., Mein, P., Vial, J.C., Shine, R.A., Woodgate, B.E. 367

Planetary Systems

The Six-day Rotation Period of 1689 Floris-Jan: A New Record Among Slowly Rotating Asteroids
Schober, H.J., Surdej, J., Harris, A.W., Young, J.W. 257

On Asteroid Classifications in Families
Carusi, A., Valsecchi, G.B. 327

Celestial Mechanics and Astrometry

Conversion of Positions and Proper Motions from B 1950.0 to the IAU System at J 2000.0
Standish, E.M., Jr. 20

A Pool of Faint Stars Applied to Star Catalogue Formation
Hering, R., Walter, H.G. 197

Physical Processes and Astrophysical Plasmas

Diffusion of Keplerian Motions by a Stochastic Force. II. Lorentz Scattering of Interplanetary Dusts
Barge, P., Pellat, R., Millet, J. 8

Cyclotron Emission in Strongly Magnetized Plasmas
Herold, H., Ruder, H., Wunner, G. 90

Soft X-ray Filter Spectroscopy of the Supernova Remnants Vela X and Puppis A
Burkert, W., Zimmermann, H.U., Aschenbach, B., Bräuninger, H., Williamson, F. 167

(RN) Electron Densities from the O IV] λ 1401 Multiplet
Nussbaumer, H., Storey, P.J. 205

Instruments, Data Processing, and Numerical Methods

The Width of Echelle Orders in IUE Images as Derived with the Astronomical Image Display and Analysis (AIDA) System in Tübingen
de Boer, K.S., Preussner, P.-R., Grewing, M. 128

Abstracts of Articles Which Are Being Published in A. & A. Suppl. Ser. , No.

The Fourth Meridian Catalogue of Besançon Observatory (Text in French)
Crézé, M., Mazodier, B., Claireмidi, J., Colin, J., Considère, S., Hilaire, G., Oblak, E., Parisot, J.P., Puel, F., Andrez, R., Athanase, M., Chabod, D., Godet, L., Jeandenans, P., Mougin, B., Vincent, A., Vincent, M. 216

An Accurate Derivation of the Division Corrections in a Photoelectric Meridian Circle
Miyamoto, M., Kühne, C. 216

Inventory of Major Operational and Planned Ground-based Astronomical Telescopes of the Countries Represented in the European Science Foundation (Second Edition, 1982)
European Science Foundation, (ESF) 216

Results of Observations Made in Paris with the Astrolabe (Text in French)
Chollet, F., Débarbat, S., Hascoët, J.C., Lam, S.K., Texier, P., Tomas, M. 217

Equivalent Widths of Spectral Lines in B-type Stars (Text in French)
Didelon, P. 217

Radio Observations at 14.7 GHz of Southern Planetary Nebulae
Milne, D.K., Aller, L.H. 217

A 1415 MHz Survey of Seyfert and Related Galaxies. III
Wilson, A.S., Meurs, E.J.A. 217

The Mid-ultraviolet Spectrum of ε Aurigae
Castelli, F., Hoekstra, R., Kondo, Y. 217

Absolute Ultraviolet Fluxes of Elliptical Galaxies as Observed with the Astronomical Netherlands Satellite (ANS)
de Boer, K.S. 218

Electronographic Photometry in the Galactic Cluster M 37
Robin, A. 218

UBV-Hβ Photometry of Luminous Stars Between $l=335°$ and $l=6°$
Dachs, J., Kaiser, D., Nikolov, A., Sherwood, W.A. 218

Physical Studies of Asteroids. VIII. Photoelectric Photometry of the Asteroids 42, 48, 93, 105, 145, and 245
Debehogne, H., Lagerkvist, C.-I., Zappalà, V. 218